

## REMARKS

Pursuant to 37 C.F.R. § 1.111, Applicants respectfully request reconsideration of the claim rejections set forth in the Office Action dated June 6, 2006.

### Summary

Claims 1, 63, and 66 – 68 were amended. No new matter was added as a result of these amendments. Claims 9 and 69 – 70 were cancelled.

### Claim Rejections

#### **35 U.S.C. § 112**

Claim 9 was rejected pursuant to 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 has been canceled.

Claims 1 – 9 and 63 – 65 were rejected pursuant to 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 63 have been amended to recite “the first series resonant frequency  $f_0$  is determined by disconnecting the chamber from the rest of the system so that the chamber is in a non-discharge state and then measuring impedance of the path from the feed plate to the ground via the shaft with an impedance meter while varying the oscillation frequency.” Accordingly, Claims 1 – 9 and 63 – 65 are in condition for allowance.

Claims 66 – 68 were rejected pursuant to 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 66 – 68 have been amended to more clearly describe the claimed subject matter. Accordingly, Claims 66 - 68 are in condition for allowance.

### 35 U.S.C. § 103

Claims 1 - 6, 8, and 9 were unpatentable pursuant to 35 U.S.C. § 103(a) over Murata et al. (U.S. Patent 5,423,915) in view of Patrick et al. (U.S. Patent 5,474,648).

Amended Claim 1 recites a plasma processing apparatus comprising, *inter alia*, the first series resonant frequency  $f_0$  is determined by disconnecting the chamber from the rest of the system so that the chamber is in a non-discharge state and then measuring impedance of the path from the feed plate to the ground via the shaft with an impedance meter while varying the oscillation frequency.

Murata et al. and Patrick et al. fail to disclose, either individually or in combination, the first resonant frequency  $f_0$  as recited by Claim 1.

In response to the Examiner's "intended use" argument, the Applicant respectfully submits that Claim 1 has been amended to recite limitations of the claimed subject matter. It is well established that product claims may include process steps to wholly or partially define the claimed product. See *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA, 1972), and the cases cited therein. To the extent these process limitations distinguish the *product* over the prior art, they must be given the same consideration as traditional product characteristics [emphasis in original].” *In re Luck*, 476 F.2d 844, 120 USPQ 523 (CCPA, 1973).

Murata et al. fail to disclose the first series resonant frequency as recited in Claim 1. More specifically, Murata et al. fail to teach or suggest that the first series resonant frequency is determined by disconnecting the chamber from the rest of the system so that the chamber is in a non-discharge state and then measuring impedance of the path from the feed plate to the ground via the shaft with an impedance meter while varying the oscillation frequency. Accordingly, Claim 1 is allowable over the teaching of Murata et al.

Patrick et al. fail to disclose the first series resonant frequency as recited in Claim 1. More specifically, Patrick et al. fail to teach or suggest that the first series resonant frequency is determined by disconnecting the chamber from the rest of the system so

that the chamber is in a non-discharge state. In fact, Patrick et al. teach a contrary arrangement. Patrick et al. disclose “a radio frequency matching network is connected between the output of a radio frequency power generator and a plasma chamber electrode” (Column 4, Lines 21 – 24). “A radio frequency power sensor adjacent to the chamber electrode accurately measures the actual radio frequency power being delivered to the plasma chamber” (Figure 2A, Column 4, Lines 23 – 26). “The sensor may also measure the voltage, current and phase angle at the chamber electrode, and measure the chamber impedance as desired” (Column 4, Lines 26 – 28). In other words, the RF parameter sensor connected directly between the generator 102 and the plasma electrode 112 monitors certain characteristics that are used to calculate the input impedance at the plasma electrode. Patrick et al. teach an arrangement where if the plasma chamber 104 is disconnected from the generator 102 then there is no power supplied to the plasma chamber 104, and thus all the monitored values will be zero. Thus, the impedance of the plasma chamber 104 in a non-discharge state cannot be measured. Accordingly, Claim 1 is allowable over the teachings of Patrick et al.

Patrick et al. also fail to disclose measuring impedance of the path from the feed plate to the ground via the shaft with an impedance meter while varying the oscillation frequency. As discussed above, Patrick et al. teach measuring “the voltage, current and phase angle at the chamber,” and thus calculating the impedance from these values. Thus, Patrick et al. fail to disclose an arrangement that determines the series resonance frequency from the impedance characteristic. Accordingly, Claim 1 is allowable over the teachings of Patrick et al.

Dependent Claims 2 – 9 depend from an allowable base claim and are allowable for at least this reason.

Independent Claim 63 recites a feature that is similar to the distinguishable feature recited in Claim 1. Accordingly, Claim 63 is allowable over the cited for at least the same reasons as discussed above.

Dependent Claims 64 and 65 depend from an allowable base claim and are allowable for at least this reason.

Independent Claim 66 recites, *inter alia*, at least one of the shape of a feed plate, the overlapping area of the plasma excitation electrode and a chamber wall, insulation material between the plasma excitation electrode and the chamber wall, or the capacitance between a susceptor electrode and the chamber wall is adjusted such that three times the first series resonant frequency  $f_0$  is larger than a power frequency  $f_e$  supplied from the radio frequency generator. Patrick et al. Murata et al. fail to disclose adjusting the properties recited in Claim 66. Accordingly, Claim 66 is allowable over the cited prior art.

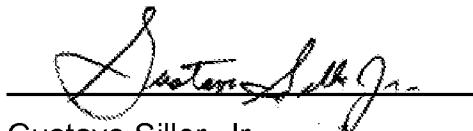
Dependent Claims 67 - 68 depend from an allowable base claim, so are allowable for at least this reason.

## **Summary**

For at least the reasons given above, the Applicants respectfully submit that the pending claims are allowable and request that a Notice of Allowance issue.

The Examiner is respectfully requested to contact the undersigned in the event that a telephone interview would expedite consideration of the application.

Respectfully submitted,



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